Treatment with IMiDs and/or PI pre-transplant was associated with better survival versus no prior exposure to these agents but this was not statistically significant ($P = .11$) (Figure 2).
In this analysis, we show that a significant number of patients undergo delayed ASCT for MM. Outcomes of ASCT after L1 and L2 were similar. This being a retrospective study, we cannot asses the number of patients who intended to but were not able to undergo delayed ASCT. Exposure to one or both highly active anti-myeloma agents (IMids and PI) before ASCT was associated with better post transplant outcomes.

171

Low-Dose Plerixafor is Effective and Less Costly for Peripheral Blood Stem Cell Mobilization in Patients with Lymphoma and Multiple Myeloma Undergoing Autologous Transplantation

David Gómez-Almaguer, *Perla R. Colunga-Pedraza, Dalila Marisol Alvarado-Navarro, Andrés Gómez-De León, Guillermo Sotomayor-Duque, Rosario Salazar-Riojas, Olga Graciela Cantu-Rodriguez, Nereida Mendez-Ramirez, Cesar Homero Gutierrez-Aguirre. Servicio de Hematología, Hospital Universitario "Dr. José Eleuterio González", Universidad Autónoma de Nuevo León, Monterrey, Mexico*

Introduction: Approximately 10-30% of candidates to autologous hematopoietic stem cell transplant (HSCT) are unable to collect an adequate yield of CD34+ cells/kg. Peripheral blood stem cell (PBSC) mobilization strategies vary considerably but the optimal methodology for mobilizing PBSC is not well defined. Plerixafor (Mozobil®) is approved for the mobilization of PBPC in combination with G-CSF at a dose of .24 mg/kg once daily for up to 4 consecutive days; however, it is an expensive drug and is expected to increase costs associated with PBSC harvest. We aim to investigate the safety and efficacy of the administration of low-dose plerixafor in mobilizing CD34+ cells plus G-CSF in MM and lymphoma.
Methods: It is a preliminary report of a single-institution, open-label, phase II trial to test the feasibility and efficacy for mobilization of low-dose plerixafor added to daily G-CSF in patients with MM or NHL undergoing autologous HSCT. The mobilization protocol consisted of G-CSF (10 µg/kg) subcutaneously daily for 4 days and plerixafor (.12 mg/kg) administered subcutaneously 11 hr prior to apheresis. Stem cells collection was performed with a Cobe Spectra® or Spectra Optia® apheresis system. The planned target blood volume to be processed was 4-fold total blood volume. Peripheral blood CD34+ counts were analyzed using flow cytometry. Primary endpoint was the proportion of patients achieving at least 2×10^6 CD34+cells/kg in 1 apheresis harvest. Secondary end points included the rate of successful CD34+ cell mobilization, defined as a peak of CD34+ cells in PB >20 cells/mL. We measure PB CD34+ cells the day 4 and 5 after plerixafor administration. Toxicities and engraftment were documented.
Results: Fifteen patients have been enrolled. Eight with MM, 5 with NHL, and 2 HL. The median PB CD34+ cell count for patients on day 4 before receiving plerixafor was 12.3/mL (range, 2.2-168.8) whereas on day 5 after plerixafor was 50.8/mL (range, 8.2-360.7) ($P = .001$). The median collection yield was 4.5×10^6 CD34+ cells/Kg (range, 1.27 – 24.5 million CD34+ cells/Kg). Plerixafor was well tolerated in most patients, only 2 referred moderate diarrhea. Thirteen of the 15 patients reached the target cell count (86%) with only 1 day of collection. Median neutrophil and platelet engraftment of 12 (range, 9-18) and 12 days (range, 9-16), respectively. Two patients are on day +2 and +6 and waiting for engraftment.
Conclusions: Failure of PBSC mobilization is a critical issue for MM and NHL patients undergoing autologous HSCT. The combination of low-dose plerixafor with G- CSF in this study achieved 86% of successful yields, and appears to be an efficient and safe approach in first-line to improve the success of the yield. Aside of the costs related to plerixafor, this strategy can be counterweighed by reducing other resources as reducing number of apheresis and possibly reducing the impact on quality of life for patients.

172

Autologous Hematopoietic Stem Cell Transplantation Indication to Patients over 65 Years Old as Treatment of Choice for Multiple Myeloma

Cristina Vogel [1], *Bruna Franco Massa* [2], *Nelson Hamerschlak* [1], *Cinthya Correa Silva* [1], *Fabio R. Kerbauy* [3], *Danielle Ovigli Lopes* [4], *Beatriz Araujo da Silva* [2]. *[1] BMT, Hospital Israelita Albert Einstein, São Paulo, Brazil; [2] Albert Einstein Hospital, Sao Paulo, Brazil; [3] Hematology and Bone Marrow Transplantation Dept, UNIFESP (Universidade Federal de Sao Paulo), Sao Paulo, Brazil; [4] Albert Einstein Hospital, Sao Paulo, Brazil*

Multiple myeloma (MM) is a neoplasm resulting from plasma cells clonal proliferation. New therapies and Autologous Hematopoietic Stem Cell Transplantation (HSCTa) routine use have led to substantial improvements in overall response rate and durable remissions.[1] Its incidence increases with age and about 63% of patients are over 65 years old at diagnosis,[2] which, in most cases, impacts eligibility and performance at the HSCTa.[3] Patients younger than 65 years old, with no significant co-morbidities and a good performance status, are generally eligible for HSCTa as first-line treatment.[1,4]
This study aims to study retrospectively 96 patients between 25 and 74 years old, who had MM and performed their first HSCTa from 2005 to 2016, in a large private hospital in São Paulo. The following information regarding the transplant moment was analyzed descriptively and quantitatively: demographic data, MM subtype, Karnofsky Performance Status (KPS), International Staging System (ISS) and Durie-Salmon (DS) staging, pre-HSCTa disease status, incidence of relapse and death for the study of outcomes, using Kaplan-Meier analysis and Log-Rank tests. The majority were male (61, 45%), IgG secretors (60, 41%), DS III stage (44, 79%), ISS I (36, 45%), KPS 90-100 (67, 7%), on partial clinical response to previous treatment (65, 62%). Patients were divided into two groups for comparison: 74 patients under 65 (Group 1) and 22 patients over 65 years old (Group 2). Group 1 had an average overall survival (OS) of 9, 0 ± 0, 6 years (95% CI = 7, 7-10, 2) and their OS probability was 89, 4% in one year, 70, 8% in five and 67, 4% in ten years. Group 2 presented an average OS of 6, 7 ± 0, 9 years (95% CI = 5, 0-8, 5) and their probability of OS was 94, 7% in one year, 73, 2% in five and 29, 3% in ten years. There was no significant statistical difference in OS between both groups. Group 1 disease-free survival (DFS) probability was 80, 2% in one year, reaching 45, 7% and 15, 6% in five and 10 years, respectively. Group 2 DFS probability was 90, 2% in one year, 38, 6% in five and 14.5% in ten years, respectively. There was statistical difference in DFS between the two groups only in patients submitted to HSCTa on ISS III and patients with IgA subtype.
Thus, it can be inferred that age as an isolated factor should not be used as an eligibility standard for HSCTa in patients over 65 years old with MM.
This should be based on detailed multiprofessional assessments allied to clinical evaluation of the patients' condition,

since HSCTa may be considered a first-line treatment for these patients.

173

Age is Not an Important Factor for Autologous Peripheral Hematopoietic Stem Cell Mobilization and Collection in Patients with Multiple Myeloma

Osman Ilhan [1], *Guldane Cengiz Seval* [2], *Selami Kocak Toprak* [1], *Sinem Civriz Bozdag* [1], *Meltem Kurt Yuksel* [1], *Pervin Topcuoglu* [3], *Onder Arslan* [3], *Muhit Ozcan* [4], *Taner Demirer* [3], *Hamdi Akan* [3], *Meral Beksac* [4], *Gunhan Gurman* [3]. [1] *Ankara University School of Medicine Department of Hematology, Ankara, Turkey;* [2] *Hematology, Yildirim Beyazit University Yenimahalle Education and Research Hospital, Ankara, Turkey;* [3] *Department of Hematology and Stem Cell Transplantation Unit, Ankara University Faculty of Medicine, Ankara, Turkey;* [4] *Hematology, Ankara University School of Medicine, Ankara, Turkey*

Background: We retrospectively compared myeloma patients <65 years with >65 years of age, analyzing CD34 mobilization into peripheral blood and the number of leukapheresis needed to collect at least one single stem cell graft.
Material&Methods: From February 1999 through August 2017, data from 561 myeloma patients below the age of 65 were compared to 70 myeloma patients above 65 years of age who were eligible for auto HSCT according to geriatric assessment (GA). All these data were obtained from the Ankara University Faculty of Medicine Center for Therapeutic Apheresis and written informed consent was signed according to our institution regulations. Patients underwent further PBSC collections until we obtained the target dose >20 CD34+ cells/μL blood. A maximum of 3 collections were performed in the first mobilization; if the cell dose was not achieved, we submitted patients to a second mobilization.
Results: Seventy of 631 patients were above 65 years of age (median age 67, range 65-77) and 561 patients were below the age of 65 (median age 54, range 29-64). Baselinecharacteristics of the older and younger patient cohorts are summarized in Table 1. The chemotherapy regimens were not statistically different between both age groups (chi square p value .28). The number of CD34-positive circulating cells before scheduled leukapheresis was mean 66.58 ± 2.67 cells/μL (median 46 cells/ μL, range 2-397) in all patients (including patients who failed mobilization).
Conclusion: Patients above 65 years of age have enough progenitor cells in the actual graft but still the number is inferior compared to the younger population and this can be overcome by an increased number of leukaphereses.

Table 1
Patients Characteristics

Patients	≥65 years	<65 years	$P < .05$
Gender (M/F) (n)	53/17	344/217	.018
Median age (years (range))	67 (65-77)	54 (29-64)	.00*
Mobilization Regimens (n)			.436
GCSF	58 (82.9%)	424 (75.6%)	
Chemotherapy	11 (15.7%)	98 (22.1%)	
Plerixafor	1 (1.4%)	13 (2.3%)	
Median number of leukapheresis (range)	2 (1-3)	2 (1-3)	.48
Peripheral CD34 (+) cells/μL (first mobilization attempt)	50.96 ± 7.04	68.57 ± 8.35	.006*
Mean CD34 (+) cells/ml ($\times 10^6$/kg) (first mobilization attempt)	4.53 ± 3.87	6.66 ± 1.34	.002*

174

Role of Salvage Transplant in Relapsed Multiple Myeloma Patients in the Era of Novel Agents

Naga Sai Krishna Patibandla [1], *Amir Kamran* [2], *Amulya Yellala* [3], *Santhosh Sadashiv* [4], *Gina Berteotti* [5], *Cyrus Khan* [4], *Salman Fazal* [4], *Anna Kaminsky* [6], *Prerna Mewawalla* [5], *John Lister* [4]. [1] *Internal medicine and Hematology-Oncology, Allegheny Health Network, Pittsburgh, PA;* [2] *Hematology-Oncology, Allegheny Health Network, Pittsburgh, PA;* [3] *Allegheny Health Network, Pittsburgh, PA;* [4] *Western Pennsylvania Cancer Institute, Allegheny Health Network, Pittsburgh, PA;* [5] *Division of Hematology and Cellular Therapy, Allegheny Health Network Cancer Institute, Pittsburgh, PA;* [6] *Hematology and Cellular Therapy, Allegheny Health Network Cancer Institute, Pittsburgh, PA*

Objective: To evaluate the efficacy and tolerability of salvage auto-HCT in the era of novel agents.
Patients and Methods: We conducted a retrospective analysis of 27 previously transplanted patients who underwent repeat auto-HCT for relapsed MM at our institution between June 2000 and May 2017. Patients underwent salvage auto-HCT after prior single auto-HCT (n = 18), after prior tandem auto-HCT (n = 7) or after 2 previous auto-HCT (n = 2). Patients who had two prior transplants (Two Prior Tx) were grouped together (n = 9). Median age at salvage auto-HCT was 59 years (range: 48-72) and median interval to salvage auto-HCT from last transplant was 58 months (range: 16-165).
Results: At a median follow up of 27 months, PFS and OS between the two groups (One Prior Tx or Two Prior Tx) was not statistically significantly different (PFS, $P = .55$; OS, $P = .64$). Treatment related mortality (TRM) occurred in one patient in the Two Prior Tx group at day +17 from refractory bacterial infection. No TRM was observed in the One Prior Tx group. One patient in the Two Prior Tx group was diagnosed with treatment related MDS at 9 months after salvage transplant and died at 16 months of MDS related complications. Response to salvage auto-HCT in the One Prior Tx and Two Prior Tx groups was PR 28% and 14%, VGPR 50% and 71% and CR 17% and 14%, respectively. One patient in the One Prior Tx had SD.
Conclusion: Therapeutic options for patients with relapsed multiple myeloma (MM) following a prior auto-HCT might include novel agents as well as salvage auto-HCT. This retrospective analysis demonstrates that salvage auto-HCT is tolerable and appears equally effective in patients having previously received one or two auto-HCT. The comparative efficacy of novel agents versus salvage auto-HCT is unknown. Our data suggest that salvage auto-HCT in selected patients remains a viable option even in the era of novel agents.